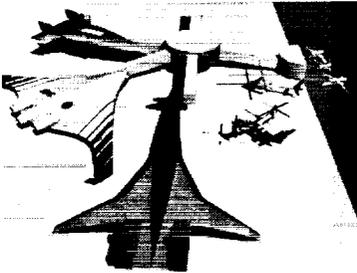


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AvSTAR Workshop



Tomorrows' Air Transportation System



Breakout Session Report

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Outline



- **Chair Comments**
- **General Comments**
- **Comments on the Seven Research Elements**

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Chair Comments

- General Reactions
 - There is enthusiasm for AvSTAR and appreciation to NASA for involving the community in the program planning process
 - The seven “Tomorrow’s System” elements appear to encompass the needed steps to fill gaps and augment efforts to achieve the goals of Free Flight
 - There did not appear to be any missing elements in the AvSTAR program
 - There is interest in having additional opportunities to learn more about the program and to help plan AvSTAR

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Chair Comments

- General Recommendations
 - The safety implications of new automation tools and procedures must be assessed so that margins are not eroded
 - New automation tools need to be compatible with the evolving ATC system
 - The FAA certification process needs to be more certain as it may hinder the introduction of new technology

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Other General Comments

- Continue the development of a strong business case for AvSTAR:
 - State an overall investment strategy
 - Provide explanations for continuing with TAP/AATT initiated work (e.g. AVOSS, SMS, aFAST)
 - Need to have realistic expectations of AvSTAR benefits
 - State the potential impact on top-50 airports (a stop-light chart)
 - Insure that AvSTAR addresses delay causality and how much of this delay can be avoided through improved procedures and automation
- Insure that AvSTAR addresses decision making under the uncertainties in weather predictions
- The ATC system is an information exchange problem and NASA should examine application of information technologies
- NASA should conduct research into the design strategies, test strategies, etc. to assure safety and fault tolerance in ATM software

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Other General Comments – 2

- Tool integration is vital
 - NASA, working with the FAA, must take a responsibility for how each tool fits into the FAA architecture.
 - Human factors
 - Systems engineering
- NASA should develop a simulation/modeling capability as a basis for understanding needed improvements in ATC operations
- NASA should consider taking ATM tools to a higher TRL level to help close the technology transfer gap
- Flight deck human factors needs must be a part of the program
- ATM should be considered for the smaller airports
 - The growing regional airports should be considered
- Environmental issues should be addressed in all program elements
- Recommend early FAA Regulation and Certification involvement

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Surface Congestion Alleviation

- Assure AvSTAR developments in surface automation are integrated and properly account for emerging industry surface tools
- Take advantage of Safe Flight 21 results/knowledge
- Cockpit systems need to be included as part of the surface congestion solution
- The surface congestion solution must include the integration of arrival, departure, and surface automation tools and procedures

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Runway Productivity

- Continued Wake Vortex Work is needed
 - Departure and arrival wake vortex spacing requirements significantly limit traffic flow
 - Continued development of sensors and systems that can safely reduce current limits are highly desired
- A cockpit display that enables “Virtual” VMC for reduced separation (“enhanced visuals”) is needed
- Need to continue development of technologies that will allow improved utilization of closely spaced or converging runways

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Enhanced Arrival/Departure Tools

- Need tools that help controllers maintain separation
- Operations of DSTs should include input and coordination with other ATS initiatives
- Integrate AvSTAR decision support tool output data with airline operational decision tools/systems
- 2010: Time-based separation should be a goal

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Integrated Airspace Decision Support Tools

- Time based scheduling must be the guiding philosophy for all research and decision support tool development
- Developments within AvSTAR must be integrated and compatible with other tools being deployed by the FAA.
- Conduct research on how best to use data link in ATC automation

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National Traffic Flow Management

- Develop a rapid modeling tool that provides forecast capabilities (what if?) for all users
 - FAA/AOC
- Produce optimal solutions based on shared information to enable decision makers to-
 - Incorporate triggering mechanisms for initiatives
 - Define exit mechanisms for every initiative
- A unified TFM system is needed
 - Must move from an open-loop SCC TFM to one that has interaction between strategic and local TFM activities
- Need to develop technology that will better predict sector overload and move towards dynamic resectorization
 - Develop metrics for controller workload and feasible sector throughput
 - Develop the means to handle dynamic resectorization across TRACON and Center boundaries
 - Improve the reliability of sector monitor alerts

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Runway Independent Operations

- The business case for investment in runway independent operations needs clarification
 - Future role in US air transportation system
- Operational concept needs more clarity

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ATM TFM Weather

- Ensure weather hazards are accounted for in new automation initiatives and policies
 - Consider use of artificial intelligence methods to interpret weather obstacles
- Ensure the flight deck has access to weather information and the automation to assist the pilot in using this information
 - Build a tool to help pilots in the diversion decision and contingency planning
 - Provide complete NAS (weather?) status for the pilots

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Terminal Weather

- Provide better predictions of convective weather and ceiling/visibility
- FAA Aviation Weather Research has developed a 60 minute convective weather forecast tool, but
 - Accurate forecast greater than 60 minutes will be hard to accomplish in next 10 years
- However, merging weather with ATM DSTs can improve safety

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